

**DETAILED ACTION**

***Response to Arguments***

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection necessitated by amendment.

***Claim Objections***

Claim 36 is objected to because of the following informalities: In the first line, comprising should be followed by ":" instead of ",". As it stands, this portion of the claim is grammatically incorrect. Appropriate correction is required.

***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 36 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claims 36 is are drawn to functional descriptive material recorded on a computer useable medium. According to 1351 OG 212, dated 2/23/2010, computer useable medium will be reasonably interpreted to cover both non-transitory tangible media and transitory propagating signals per se in view of the ordinary and customary meaning of computer readable media. Furthermore, examiner notes that the cited interpretation is valid even if the specification is silent in regards to computer readable media and other such variations.

"A transitory, propagating signal ... is not a "process, machine, manufacture, or composition of matter." Those four categories define the explicit scope and reach of subject matter patentable under 35 U.S.C. § 101; thus, such a signal cannot be patentable subject matter." (*In re Petrus A.C.M. Nuijten*; Fed Cir, 2006-1371, 9/20/2007).

Because the full scope of the claim as properly read in light of the disclosure encompasses non-statutory subject matter, the claim as a whole is non-statutory. The examiner suggests amending the claim to include the disclosed tangible computer readable media, while at the same time excluding the intangible media such as signals, carrier waves. Any amendment to the claim should be commensurate with its corresponding disclosure.

Examiner suggests, as seen within 1351 OG 212 dated 2/23/2010, applicant include the limitation, "non-transitory", within the cited claims to overcome the rejection and to avoid any issues of new matter.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 6, 7, and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 6 recites the limitation "the increase" in the last line. There is insufficient antecedent basis for this limitation in the claim. Claim 6

relies on the "an increase" limitations present in amended claim 1, but does not depend from claim 1. Claim 7 recites the limitation "the threshold value" in the last line. There is insufficient antecedent basis for this limitation in the claim. Claim 7 relies on the "a threshold" limitations present in claim 6 but does not depend from claim 6. Dependent claim 8 does not remedy the deficiency of claim 7. Claim 10 recites the limitation "the target" in the last line. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by JPN 10154284 (Takeda).

As per claim 1, Takeda teaches a method of detecting particles, comprising the following steps (**Takeda: abstract: "smoke sensing"; Drawing 2**):  
emitting a beam of radiation into a monitored region (**Takeda: abstract: "laser beam"; Drawing 2, 5-8**);  
capturing images of the monitored region, having one (**only 1 required**) or more image segments, with an image capture device (**Takeda: abstract: "photographing area...**

**with the camera”; para 0013: “part” Drawing 2); and**  
in a data processor, detecting a variation in scattered radiation in images of the monitored region indicating the presence of the particles, wherein the detected variation is an increase in scattered radiation intensity (**Takeda: para 0012: “remarkable change appears in dispersion by the particles of smoke”; para 0013: “measure is performed by an image processing means”; 0014; para 0025: “laser beams are scattered about and will be in the state where the dispersion field P can be recognized... proportionality is realized between the concentration of the smoke, and the luminosity of the dispersion field”; para 27; Drawing 1).**

Arguments made in rejecting claim 6 are analogous to arguments for rejecting claim 1. Takeda also teaches wherein the increase is assessed with reference to a threshold value (**Takeda: para 0029: “difference is 0 when there is no generating of smoke”; paras 14 and 35: decision to trigger alarm in response to detection of smoke is indicative of threshold).**

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-3, 9, 13, 14, 35, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over JPN 05020563 (Ishii) in view of USPGPubN 20020135490 (Opitz).

As per claim 2, Takeda in view of Opitz teaches a method as claimed in claim 1. Takeda does not teach modulating the beam of radiation. Opitz teaches modulating the beam of radiation (**Opitz: para 14; abstract; paras 6-10, 12-15**).

Thus, it would have been obvious for one of ordinary skill in the art at the time the invention was made to implement the teachings of Opitz into Takeda since Takeda suggests smoke in a monitoring region using a light emitter and an imaging device and processing the captured images in general and Opitz suggests the beneficial use of detecting smoke in a monitoring region using a light emitter and an imaging device and processing the captured images wherein temporally spaced images are compared so that "smoke and/or fire in the room can be detected with high reliability and very quickly" (para 7) in the analogous art of image processing. Furthermore, one of ordinary skill in the art at the time the invention was made could have combined the elements as claimed by known methods and, in combination, each component functions the same as it does separately. One of ordinary skill in the art at the time the invention was made would have recognized that the results of the combination would be predictable.

As per claim 3, Takeda in view of Opitz teaches a method as claimed in claim 2, wherein scattered radiation within the zone is represented in one or more segments of a

corresponding image, which allows for the location of the particles in the region to be identified (**Takeda: See arguments made for rejecting claim 1**). Opitz teaches scattered radiation within the zone is represented in one or more segments of a corresponding image, which allows for the location of the particles in the region to be identified (**Opitz: para 10, 22, 23**).

As per claim 9, Takeda in view of Opitz teaches a method as claimed in claim 1. Takeda does not teach directing the radiation along a path and identifying a target in the images, the target representing a position at which the radiation is incident on an objective surface within the region. Opitz teaches directing the radiation along a path and identifying a target in the images, the target representing a position at which the radiation is incident on an objective surface within the region (**Opitz: Note that the smoke cloud or a particle within the smoke cloud can be understood to be the target. The emitted light is clearly incident on the target and is directed along a path as shown in Fig. 2. The targets (image elements) are detected in the image; Figs. 1, 2; abstract; paras 6-10, 12-15**).

As Claim 13, Takeda in view of Opitz teaches a method as claimed in claim 1. Takeda does not teach the images are processed as frames which are divided into sections which represent spatial positions within the monitored region. Opitz teaches the images are processed as frames which are divided into sections which represent spatial positions within the monitored region (**Opitz: abstract; paras 6-10, 12-15; Note that**

**the prior image and subsequent image of the scene are understood as “processed as frames”).**

As Claim 14, Takeda in view of Opitz teaches a method as claimed in claim 13. Takeda does not teach monitoring intensity levels in associated sections of the images and assigning different threshold values for different spatial positions within the region which correspond to the associated sections. Opitz teaches monitoring intensity levels in associated sections of the images and assigning different threshold values for different spatial positions within the region which correspond to the associated sections (**Opitz: paras 6-10, 12-15**).

Arguments made in rejecting claims 35 and 36 are analogous to arguments for rejecting claims 1 and 2.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over JPN 10154284 (Takeda) in view of USPN 6292683 (Gupta).

Arguments made in rejecting claim 7 are analogous to arguments for rejecting claims 1 and 6. Takeda does not teach wherein the threshold value is calculated by averaging integrated intensity values from the images. Gupta teaches wherein the threshold value is calculated by averaging integrated intensity values from the images (**Gupta: Col 13**,

**lines 47-52: “intensity threshold for each MR image is determined by first obtaining an average pixel intensity for each image”).**

Thus, it would have been obvious for one of ordinary skill in the art at the time the invention was made to implement the teachings of Gupta into Takeda since Takeda suggests a system for detecting objects in images in general and Gupta suggests the beneficial use of a system for detecting objects in images wherein threshold are determined by averaging the images in the analogous art of image processing. It would have been obvious for one of ordinary skill in the art at the time the invention was made to implement the teachings of Gupta into Takeda since it is conventionally known that determining an average of data provides a statistical description of that data useful in making decisions. Furthermore, one of ordinary skill in the art at the time the invention was made could have combined the elements as claimed by known methods and, in combination, each component functions the same as it does separately. One of ordinary skill in the art at the time the invention was made would have recognized that the results of the combination would be predictable.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over JPN 10154284 (Takeda) in view of USPN 6292683 (Gupta), as applied to claim 7 above, and further in view of USPGPubN 20020135490 (Opitz).



As per claim 1, Takeda in view of Gupta teaches the method as claimed in claim 7. Takeda does not teach the step of assigning different threshold values for different spatial positions within the region. Opitz teaches the step of assigning different threshold values for different spatial positions within the region (**Opitz: paras 6-10, 12-15**).

Thus, it would have been obvious for one of ordinary skill in the art at the time the invention was made to implement the teachings of Opitz into Takeda since Takeda suggests smoke in a monitoring region using a light emitter and an imaging device and processing the captured images in general and Opitz suggests the beneficial use of detecting smoke in a monitoring region using a light emitter and an imaging device and processing the captured images wherein temporally spaced images are compared so that "smoke and/or fire in the room can be detected with high reliability and very quickly" (para 7) in the analogous art of image processing. Furthermore, one of ordinary skill in the art at the time the invention was made could have combined the elements as claimed by known methods and, in combination, each component functions the same as it does separately. One of ordinary skill in the art at the time the invention was made would have recognized that the results of the combination would be predictable.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over JPN 10154284 (Takeda) in view of USPGPubN 20020135490 (Opitz) as applied to claim 9 above, and further in view of USPN 3688298 (Miller).

As per claim 10, Takeda Opitz teaches a method as claimed in claim 9, wherein a location of the target in the images is monitored (**Takeda and Opitz: See arguments made for rejecting claims 1 and 9**). Takeda does not teach the emission of radiation is ceased in response to a change in the location of the target. Miller teaches the emission of radiation is ceased in response to a change in the location of the target (**Miller: abstract: "A photo cell is stationed at the end of the path of laser light for deactivating the laser and actuating an alarm signal when the beam of light is broken by an object such as an intruder moving through the beam"; col 1, lines 52-67: "instantaneously terminating the generation of the beam when the beam is broken by an object or person moving through the beam"; Fig. 3**).

Thus, it would have been obvious for one of ordinary skill in the art at the time the invention was made to implement the teachings of Miller into Takeda since Takeda suggests a system for detecting a target in general and Miller suggests the beneficial use of a system for detecting a target using a laser wherein detected motion of the target causes the laser to be deactivated as to "safeguard the intruder, innocent or otherwise" in the analogous art of image processing. Furthermore, one of ordinary skill in the art at the time the invention was made could have combined the elements as claimed by known methods and, in combination, each component functions the same as it does separately. One of ordinary skill in the art at the time the invention was made would have recognized that the results of the combination would be predictable.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over JPN 10154284 (Takeda) as applied to claim 1 above, and further in view of JPN 362153780 (Sakagami).

As per claim 11, Takeda teaches a method as claimed in claim 1, comprising identifying a location of an emitter (**Takeda: See arguments made for rejecting claim 1**). Takeda does not teach comprising identifying a location of an emitter in the images. Sakagami teaches comprising identifying a location of an emitter in the images (**Sakagami: abstract: "To perform the detailed and accurate display of an image, by simple constitution wherein a plurality of light source arrays are rotated at a high speed and the light sources of light source bars are arranged so as to shift the positions thereof to each other allowing the loci of the light sources". The loci identify the location of the light sources in the display image**).

Thus, it would have been obvious for one of ordinary skill in the art at the time the invention was made to implement the teachings of Sakagami into Takeda since Takeda suggests a light emitting imaging system in general and Sakagami suggests the beneficial use of a light emitting imaging system wherein the location of an emitter in the image is identified as to "perform the detailed and accurate display of an image" (Sakagami: abstract) in the analogous art of image processing. Furthermore, one of ordinary skill in the art at the time the invention was made could have combined the

elements as claimed by known methods and, in combination, each component functions the same as it does separately. One of ordinary skill in the art at the time the invention was made would have recognized that the results of the combination would be predictable.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over JPN 10154284 (Takeda) and JPN 362153780 (Sakagami) as applied to claim 11 above, and further in view of USPN 3788742 (Garbundy).

As per claim 12, Takeda in view of Sakagami teaches a method as claimed in claim 11. Takeda does not teach determining an operating condition of the emitter based on radiation intensity at the identified location of the emitter. Garbundy teaches determining an operating condition of the emitter based on radiation intensity at the identified location of the emitter (**Garbundy: See arguments made for rejecting claim 11. Fig. 1: 10, 16; col 5, lines 45-67. When the intensity is returned (scattered) back to the receiver which is located in close proximity to the emitter, a pulse being received denotes that a corresponding pulse was sent from the emitter. Sakagami: See arguments made for rejecting claim 11.**).

Thus, it would have been obvious for one of ordinary skill in the art at the time the invention was made to implement the teachings of Garbundy into Takeda since Takeda suggests a system for emitting radiation directed to an area potentially encompassing a

smoke stack/plume in order to detect the presence of the smoke stack/plume in general and Garbundy suggests the beneficial use of a system for emitting radiation directed to an area potentially encompassing a smoke stack/plume in order to detect the presence of the smoke stack/plume as for "determining the presence, density, range and depth of a particular molecular species in a gas distribution" (Garbundy: col 1, lines 5-10) in the analogous art of image processing. Furthermore, one of ordinary skill in the art at the time the invention was made could have combined the elements as claimed by known methods and, in combination, each component functions the same as it does separately. One of ordinary skill in the art at the time the invention was made would have recognized that the results of the combination would be predictable.

***Allowable Subject Matter***

Claim 4 is allowed. The following is an examiner's statement of reasons for allowance: Limitations pertaining to "wherein the location of the particles is determined in accordance with a geometric relationship between the locations of a source of emitted radiation, a direction of the emitted radiation and a point of image detection wherein, the geometric relationship is determined from the images.", in conjunction with other limitations present in the independent claim, distinguish over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Atiba Fitzpatrick whose telephone number is (571) 270-5255. The examiner can normally be reached on M-F 10:00am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on (571)272-7413. The fax phone number for Atiba Fitzpatrick is (571) 270-6255.

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